FILARIASIS IN THE TRANSMIGRATION AREA OF KUMPEH, JAMBI SUMATERA*)

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ABSTRACT

*Penelitian mengenai penularan filariasis yang disebabkan oleh **Brugia malayi** telah dilakukan di daerah transmigrasi Kumpeh, Jambi. Pemeriksaan darah dilakukan terhadap para transmigran di tiga blok C, D dan E; 3 bulan, 9 bulan dan 18 bulan setelah mereka tiba di daerah ini.*

Filariasis klinis telah tampak dalam 3 bulan setelah kedatangan mereka dan terus naik pada pemeriksaan-pemeriksaan berikutnya. Delapanbelas bulan sesudah kedatangan mereka di tempat ini ditemukan satu transmigran yang mengandung mikrofilaria sedangkan "disease rate" paling tinggi ditemukan di blok D, sebesar 20,3%. Di blok E ditemukan satu orang dengan gejala limphodema.

INTRODUCTION

Human filariasis of 3 distinct species i.e. *Brugia malayi, B.timori* and *Wuchereria bancrofti* with five strains (*B.malayi* periodic and subperiodic, *B.timori, W.bancrofti* urban type and rural type) is endemic in some urban and many rural areas, transmitted by various mosquito vector species, affecting about 20 million people throughout Indonesia[1].

It is a disease of great socio-economic and public health importance for Indonesia, particulary in connection with the Transmigration Programme implemented by the Indonesian Government. In the Java Island, which is overpopulated, filariasis is observed in low endemicity and in only a few areas. To overcome this overpopulation, a transmigration programme is implemented, with relocation of group of families to a less densely populated areas in other island of Indonesia. However, some time the new location may be highly endemic for filaria. Since the work of Brug 1973 and later confirmed by others,[2,3] it has been known that filariasis among transmigrants, coming from nonendemic areas in Java and Bali, is much more severe than among the local population.

DESCRIPTION OF THE STUDY AREA

The study area is situated in the district of Kumpeh Hilir, Regency of Batanghari, Jambi Province, Sumatera.

Beyond the river Kumpeh, about 500 metres from the villages of Puding, Bangso and Pulomentaro a large patch of forest has been cleared for transmigration, in an area of 40,000 hectares which has been

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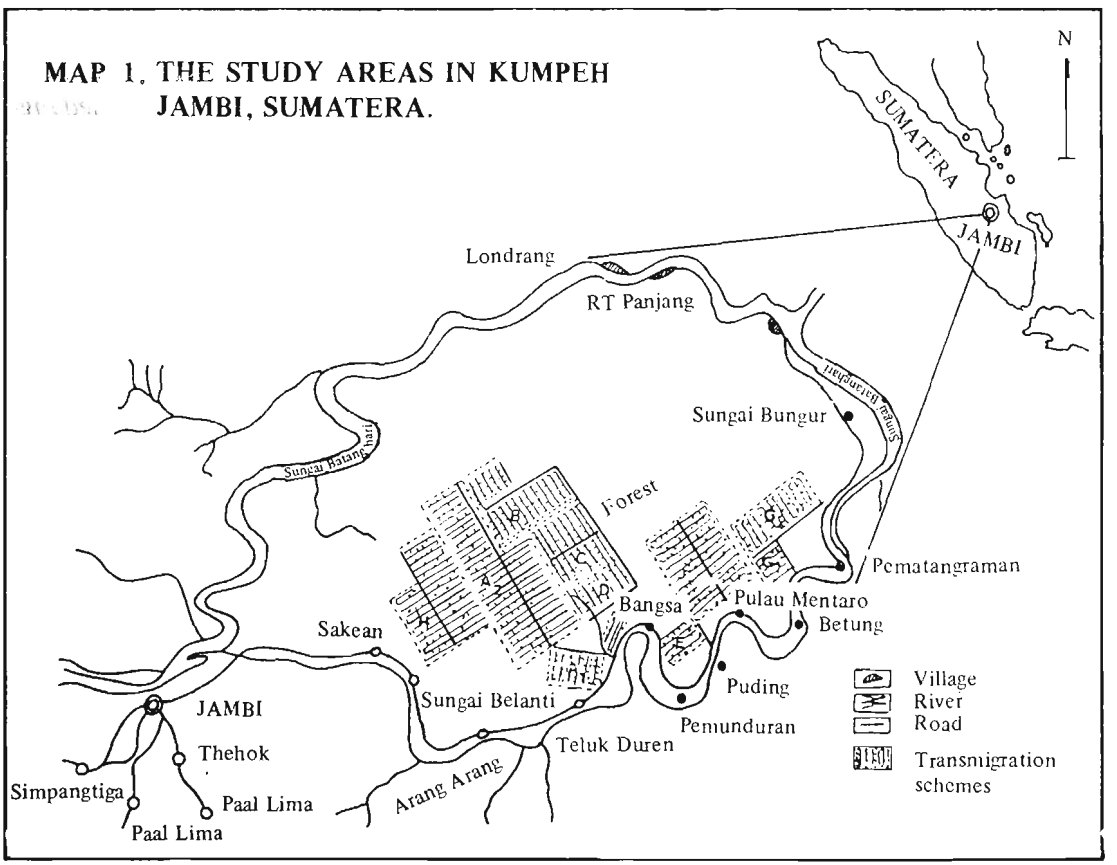
prepared since 1982/1983. Since the beginning of 1984, transmigrants were settled in three blocks, C, D, E, and consisted of 123, 199 and 154 families respectively. Block E was located close to the main road while blocks C and D were located near the forest where monkeys were abundant (Map. 1). Each family was provided with 2.25 ha of land and 1 house which has a latrine. The houses were built on stilts about 1½ m of the ground, with wooded walls and galvanized tin roof. Public buildings such as schools, a Health Centre, a public house and store house were also built to serve both the transmigrants and indigenous people.



The transmigration area was plain and fairly fertile; the type of soil was mainly organosol and clayhumus.

The transmigrants originally came from West, Central and East Java, and arrived in batches. Each batch consisted

of 100–200 families. During the first 18 months, the transmigrants were provided with rice, dried fish, cooking oil, kerosene, salt, sugar soap, fertilizer, seed, pesticide and farming equipments, before they could support themself.

Approximately one month before the transmigrant's arrival the houses were sprayed with DDT for protection againts *Anopheles* mosquitoes and other vectors, such as *Mansonia* spp. which were found in abundance in three blocks. Irrigation networks which were established in the area were the main source of water supply, while rain water was utilized during the rainy season. Only several houses have dug wells for their domestic use.

The main staple food for the transmigrants is rice, dried, fish or fish caught in the irrigation system and vegetables, mainly *Ipomoea aquatica* which grows abundantly along the ditches. Three months after arrival they were able to produce corn, cassava, peanuts, cucumber and other vegetables.

During the rainy season the area was flooded and this prevents the transmigrants from farming, however fish are abundant and fishing provide them for daily consumption and to be sold in Jambi.

MATERIALS AND METHODS

Blood and clinical surveys of acute and chronic symptoms of filariasis among the transmigrants were carried out 3 months after their arrival in the area and repeated every 6 months, to detect infections in the new area. It was presumed that there was no imported infection since the transmigrant came from non endemic areas of Java.

– **Clinical examination**

Clinical history of filariasis was obtained from each person or parents of children. Each person was examined by a physician to find acute and chronic symptoms of filariasis. Examinations were concentrated on the evidence of filarial disease [elephantiasis, lymphoedema, lymphadenitis (enlarged lymph glands), and abcess scars along the course of lymphatics and its glands, and other manifestations of filariasis]. All these data were recorded in the prepared forms.

– **Blood survey**

Two methods of blood collections were done. When possible and there was no refusal, one ml venous blood was collected and immediately transferred into a venoject prepared with anticoagulant. The next morning the blood was pressed through a nucleopore filter (3.0 um; 0.25 mm), which were dried, fixed with methanol and then stained with Giemsa solution.

In small children or refusals for having vena puncture, samples of 20 cu mm of peripheral blood were taken between 19.00–24.00 hour using capillary tubes.

Thick smears were made on microscope slide. Then next morning the smears were haemolized, fixed with methanol and then stained with Giemsa solution.

RESULTS

The results of the study was shown in Table 1. Three months after the arrival

of the transmigrants, the first clinical and parasitological studies were conducted. Some of the transmigrants who have come from the filariasis non endemic areas showed clinical symptoms however no microfilaremia was found:

a) In Block C 169 transmigrants have been examined and 3 persons (1.8%) showed filariasis symptoms.
b) In Block D 159 transmigrants have been examined and none of them shown filariasis symptoms.
c) In Block E 309 transmigrants have been examined and 4 (1.3%) showed filariasis symptoms.

Nine months after their arrival a second examination was performed, more clinical symptoms of filariasis were recorded, but still no microfilaremia was found:

a) In Block C 182 transmigrants were examined and 8 (4.4%) people showed filariasis symptoms.
b) In Block D 88 transmigrants were examined and none of them had filariasis symptoms.
c) In Block E 228 transmigrants were examined and 4 (1.7%) people showed filariasis symptoms.

Table 1 : Clinical filariasis in Transmigrants, Kumpeh, Jambi, Sumatera

Location	Exam I (3 mo)			Exam II (9 mo)			Exam III (18 mo)		
	No. Exam	No. Pos	% Pos	No. Exam	No. Pos	% Pos	No. Exam	No. Pos	% Pos
BLOCK C	169	3	1.8	182	8	4.4	321	43	13.4
BLOCK D	159	0	0	88	0	0	153	31	20.3
BLOCK E	309	4	1.3	228	4	1.7	223	20	9

Due to the heavy flood which struck the study areas, the third survey was done only 18 months after the arrival of the transmigrants or 9 months after the second survey was conducted.

During this third examination a total of 321, 153 and 223 people were examined from Block C, D, and E respectively and the clinical symptoms for filariasis were found in 43 (13.4%); 31 (20.3%)

and 20 (9.0%) people from the respective blocks. Only one person showed microfilariae of *Brugia malayi* in the blood smear and she comes from block C.

All of those who were found with filariasis symptoms were then treated with DEC using conventional dosage.

DISCUSSION

The microfilaremia rate among the transmigrants of Kumpeh was still very low at 18 months after their arrival. Only one person showed microfilariae in the blood while the clinical symptoms were positive since 3 months after their arrival and increased subsequently. Earlier studies identified that clinical symptoms were found more pronounced in transmigrants than in natives while Mf rates were usually lower in transmigrants. Brug 1937 and Partono et al., (1977) found more cases of elephantiasis in Kalawara (Central Sulawesi) compared to the natives.[4, 5] However, from Lie and Winoto's observation in a transmigrations area in South Sumatera, in 1960 it was found that while the Mf rates in transmigrants and in natives did not differ too much, elephantiasis was found only among the transmigrants.[2] They also showed that a difference could be seen between transmigrants who had some from Java and the descendents who were born in the new area.

Partono et al., (1972), found that the microfilaria rate among Javanese transmigrants in Margolembo, South Sulawesi was 0.6% after eight months of their arrival, but the rate was more than 30% for the group which had lived for 33 years in the area[3]. He concluded that the microfilaria rate was related to the duration length of residence of the transmigrants in the area. Arbain Joesoef et al., (1973), also found that the microfilaria rates in transmigrants from Bali, who settled in the district of Parigi, Central Sulawesi, was within the range of 0–13% after 10 years of residence, while the indigenous population had a microfilaria rate of 42%.[6] In East Kalimantan, Sudomo et al., (1980), found the microfilaria rate of transmigrants from Java was 0.4% after 14 months of residence, while the neighbouring villages had microfilaria rates of 9.3%.[7] Compared to the present study in Kumpeh Transmigration area the Mf rates found in other transmigration areas were higher because in Kumpeh, the natives in the indigenous villages around the transmigration area had been treated which resulted in a very low rates of Mf. Inspite of low Mf rates among the natives (after treatment), transmission still occured among the transmigrants. It was pressumed that the filariasis infections among the transmigrants was due to monkeys as reservoir host which were found in abundance in the area.[8]

A more detailed study on the transmission dynamics of filariasis in this transmigration scheme is needed.

SUMMARY

The transmigrants living in the 3 transmition Blocks, C, D, and E at Kumpeh Jambi, Sumatera were examined periodically. Blood and clinical examinations were conducted respectively at 3, 9 and 18 months after their arrival into

the endemic area. Clinical signs and symptoms of filariasis already appeared after 3 months of their arrival, and increased steadily during the following examinations. Eighteen months after arrival, a highest disease rate of 20.3% was found in block D, while the lowest was seen in block E. One case of microfilaremia was seen among the transmigrants 18 months after arrival in Block C, while one case of lymphoedema (early elephantiasis ?) was found in block E.

Filariasis transmission must have occured in all 3 Blocks, but a significantly lower rate could be seen in Block E, which was located far from the forest while Block C and D which were located near the forest area and close to the monkeys, had higher rates of clinical filariasis. In this case it is assumed that monkeys (*Presbytis cristatus*) may serve as an important reservoir for infection.

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REFERENCES

1. Arbain Joesoef and John H. Cross, 1978. Distribution and prevalence of cases of microfilaria in Indonesia. Southeast Asian J. Trop. Med. Publ. Health. 9:480–489.
2. Lie, K.J. and Winoto, R.M.P., 1960. Infeksi Wuchereria malayi di daerah transmigrasi di Kecamatan Wonosobo, Sumatera Selatan. Berita Kem. Kes. RI.
3. Partono, F., Hudoyo, Sri Oemijati, N., Borahima, J.H. Cross, M.D. Clarke, C.S. Irving and C.F. Duncan, 1972. Malayan Filariasis in Margolembo, South Sulawesi, Indonesia. Southeast Asian J. Trp. Med. Publ. Health. 3:427.
4. Brug S.L. 1973. De overbrenging van Filaria malayi te Kalawara (o.a. Paloe. Res. Manado) geneesk T. Med. Ind. 77:1462–1470.
5. Partono, F., Sri Oemijati, Hudoyo, Arbain Joesoef, H. Sajidiman, J. Putrali, M.D. Clarke and J.H. Cross, 1977b. Malayan filariasis in Central Sulawesi (Celebes) Indonesia. Southeast Asian J. Trp. Med. Publ. Health.
6. Arbain Joesoef, J.M. Caleb and J. Sulianti Saroso, 1973. Malayan filariasis in the transmigration settlements of Parigi, Central Sulawesi, Indonesia 1:1.
7. Sudomo, M., Lim Boo Liat, N. Sustriayu and Y.H. Bang, 1980. Survey of filariasis at Waru village and Babulu Darat Transmigration Scheme, East Kalimantan. Southeast Asian J. Trop. Med. Publ

Health 11:451–461.

8. Purnomo, M. Sudomo, Suwarto dan Sri Oemijati, 1988. Primata sebagai hospes reservoir Brugia malayi di daerah Transmigrasi Kumpeh, Jambi. Majalah Parasitologi Indonesia, 1:3+4.

9. Gandahusada, S., Borahima Lami, Polemi Tandi, Sumengen and Lim Boo Liat, 1980. Distribution and Prevalence of malayan filariasis in South Sulawesi, Indonesia. Health Studies in Indonesia VIII 1 & 2 : 2–28.